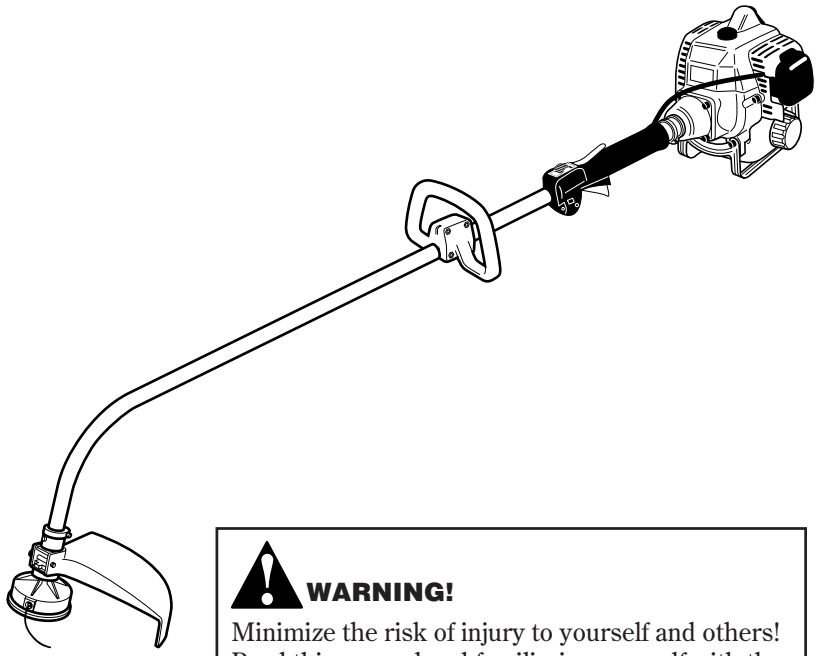
shindaiwa
Shindaiwa Inc.
11975 S.W. Herman Road
Tualatin, Oregon 97062
Telephone: 503 692-3070
Fax: 503 692-6696
www.shindaiwa.com

Shindaiwa Kogyo Co., Ltd.
Head Office: 6-2-11 Ozuka
Nishi, Asaminami-Ku
Hiroshima, 731-3167, Japan
Telephone: 81-82-849-2220
Fax: 81-82-849-2481

©2004 Shindaiwa, Inc.
Part Number 62068-94011
Printed in Japan
Rev. 3/04
Specifications subject to change without notice.

SHINDAIWA OWNER'S/ OPERATORS MANUAL

F230 GRASS TRIMMER



WARNING!

Minimize the risk of injury to yourself and others! Read this manual and familiarize yourself with the contents. Always wear eye and hearing protection when operating this unit.

shindaiwa

Part Number 62068-94011
Rev. 3/04

Introduction

The Shindaiwa F230 curved-shaft grass trimmer has been designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety or durability.

Shindaiwa's high-performance engines represent the leading edge of 2-cycle engine technology, delivering exceptionally high power at remarkably low displacement and weight. As an owner/operator, you'll soon discover for yourself why Shindaiwa is simply in a class by itself!

IMPORTANT!

The information contained in these instructions describes units available at the time of publication.

While every attempt has been made to give you the very latest information about your Shindaiwa unit, there may be some differences between your F230 and what is described here. Shindaiwa Inc. reserves the right to make changes to products without prior notice, and without obligation to make alterations to units previously manufactured.

Contents

PAGE

Attention Statements 3

Safety 4

Product Description 9

Specifications 10

Assembling the F230 11

Mixing Fuel 17

Starting the Engine 18

Stopping the Engine 20

Adjusting Engine Idle 20

Cutting Grass 22

Maintenance 23

Troubleshooting Guide 28

Emission System Warranty 32

NOTES:

Attention Statements

Throughout this manual are special "attention statements".

WARNING!

A statement preceded by the triangular attention symbol and the word "WARNING" contains information that should be acted upon to prevent serious bodily injury.

CAUTION!

A statement preceded by the word "CAUTION" contains information that should be acted upon to prevent mechanical damage.

IMPORTANT!

A statement preceded by the word "IMPORTANT" is one that possesses special significance.

NOTE:

A statement preceded by the word "NOTE" contains information that is handy to know and may make your job easier.

Read and follow this operators manual. Failure to do so could result in serious injury.

Wear eye and hearing protection at all times during the operation of this unit.

Keep bystanders at least 50 feet (15 m) away during operation.

Beware of thrown or ricocheted objects.

IMPORTANT!

The operational procedures described in this manual are intended to help you get the most from your unit as well as to protect you and others from harm. These procedures are guidelines for safe operation under most conditions, and are not intended to replace any safety rules and/or laws that may be in force in your area.

If you have questions regarding your F230 grass trimmer, or if you do not understand something in this manual, your Shindaiwa dealer will be glad to assist you.

You may also contact Shindaiwa, Inc. at the address printed on the back of this Manual.

General Safety Instructions

Work Safely

Shindaiwa grass trimmers operate at very high speeds and can do serious damage or injury if they are misused or abused. *Never allow a person without training or instruction to operate your grass trimmer!*

WARNING!
Never make unauthorized attachment installations.

Stay Alert

You must be physically and mentally fit to operate this unit safely.

WARNING!

Never operate power equipment of any kind if you are tired or if you are under the influence of alcohol, drugs, medication or any other substance that could affect your ability or judgement.

WARNING!
Minimize the Risk of Fire

NEVER smoke or light fires near the trimmer.

ALWAYS stop the engine and allow it to cool before refueling. Avoid overfilling and wipe off any fuel that may have spilled.

ALWAYS move the unit to a place well away from a fuel storage area or other readily flammable materials before starting the engine.

NEVER place flammable material close to the engine muffler.

NEVER run the engine without the spark arrester screen in place.

WARNING!
Use Good Judgment

ALWAYS wear eye protection to shield against thrown objects.

NEVER run the engine when transporting the unit.

NEVER run the engine indoors! Make sure there is always good ventilation. Fumes from engine exhaust can cause serious injury or death.

ALWAYS clear your work area of trash or hidden debris that could be thrown back at you or toward a bystander.

ALWAYS use the proper cutting tool for the job.

ALWAYS stop the unit immediately if it suddenly begins to vibrate or shake. Inspect for broken, missing or improperly installed parts or attachments.

NEVER extend trimming line beyond the length specified for your unit.

ALWAYS keep the unit as clean as practical. Keep it free of loose vegetation, mud, etc.

ALWAYS hold the unit firmly with both hands when cutting or trimming, and maintain control at all times.

ALWAYS keep the handles clean.

ALWAYS disconnect the spark plug wire before performing any maintenance work.

MAINTENANCE AND REPAIR REQUIREMENTS

You are responsible for the proper use and maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. Shindaiwa Kogyo Co., Ltd. reserves the right to deny warranty coverage if the owner has not properly maintained the engine. Shindaiwa Kogyo Co., Ltd. will not deny warranty repairs, however, solely because of the lack of repair, maintenance or failure to keep maintenance records.

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A DEALER OR SERVICE CENTER AUTHORIZED BY SHINDAIWA KOGYO CO., LTD. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

If other than the parts authorized by Shindaiwa Kogyo Co., Ltd. are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by Shindaiwa Kogyo Co., Ltd. in their performance and durability.

OBTAINING WARRANTY SERVICE

All repairs qualifying under this limited warranty must be performed by a dealer authorized by Shindaiwa Kogyo Co., Ltd.

If any emission-related part is found defective during the warranty period, it is your responsibility to present the product to an authorized Shindaiwa dealer. Bring your sales receipts showing the date of purchase for this engine. The dealer authorized by Shindaiwa Kogyo Co., Ltd. will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of Shindaiwa Kogyo Co., Ltd.

To locate an authorized Shindaiwa dealer near you, contact your Shindaiwa Distributor. For the name and telephone number of the Shindaiwa Distributor in your area, please call Shindaiwa Inc. at (503) 692-3070 between the hours of 8:00 AM and 5:00 PM Pacific Standard Time.

THIS WARRANTY IS ADMINISTERED BY

Shindaiwa Inc.
11975 S.W. Herman Rd.
Tualatin OR. 97062
(503) 692-3070

The following statement only applies to United States and its territories

Shindaiwa Kogyo Co., Ltd.
Federal Emission Design And Defect Limited Warranty
Utility And Lawn And Garden Engines

Shindaiwa Kogyo Co., Ltd. warrants to the initial purchaser and each subsequent owner, that this utility equipment engine (herein engine) is designed, built and equipped to conform at the time of initial sale, to all applicable regulations of the U.S. Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship that would cause this engine to fail to conform with EPA regulations during its warranty period. This emission warranty is applicable in all States, except the State of California.

For parts listed under PARTS COVERED, the dealer authorized by Shindaiwa Kogyo Co., Ltd. will, at no cost to you, make the necessary diagnosis, repair, or replacement of any defective emission-related component to ensure that the engine complies with applicable U.S. EPA regulations.

MANUFACTURERS WARRANTY COVERAGE

When sold within the U.S., this engine's emission control system is warranted for a period of two (2) years from the date this product is first delivered to the original retail purchaser.

OWNER'S WARRANTY RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Shindaiwa Kogyo Co., Ltd. recommends that you retain all receipts covering maintenance on your engine, but Shindaiwa Kogyo Co., Ltd. cannot deny a warranty claim solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should however be aware that Shindaiwa Kogyo Co., Ltd. may deny your warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest dealer authorized by Shindaiwa Kogyo Co., Ltd. when a problem exists.

If your Shindaiwa Dealer is unable to answer questions regarding your warranty rights and responsibilities, you should then contact your Shindaiwa Distributor.

For the name and telephone number of the Shindaiwa Distributor in your area, please call Shindaiwa Inc. at (503) 692-3070 between the hours of 8:00 AM and 5:00 PM Pacific Standard Time.

PARTS COVERED

Listed below are the parts covered by the Federal Emission Design and Defect Warranty. Some parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement of that part. The warranted parts include:

1. Carburetor Internal Components
   - Valve Assembly-throttle, Jet, Metering Diaphram
2. Ignition System Components
   - Ignition Coil
   - Flywheel Rotor

The emission control system for your particular Shindaiwa engine may also include certain related hoses and connectors.

LIMITATIONS

The Federal Emission Design and Defect Warranty shall not cover any of the following:

(a) conditions resulting from tampering, misuse, improper adjustment (unless they were made by the dealer or service center authorized by Shindaiwa Kogyo Co., Ltd. during a warranty repair), alteration, accident, failure to use the recommended fuel and oil, or not performing required maintenance services,

(b) the replacement parts used for required maintenance services,

(c) consequential parts used for required maintenance services,

(d) diagnosis and inspection fees that do not result in eligible warranty service being performed, and

(e) any non-authorized replacement part, or malfunction of authorized parts due to use of non-authorized parts.

The Properly Equipped Operator (general)

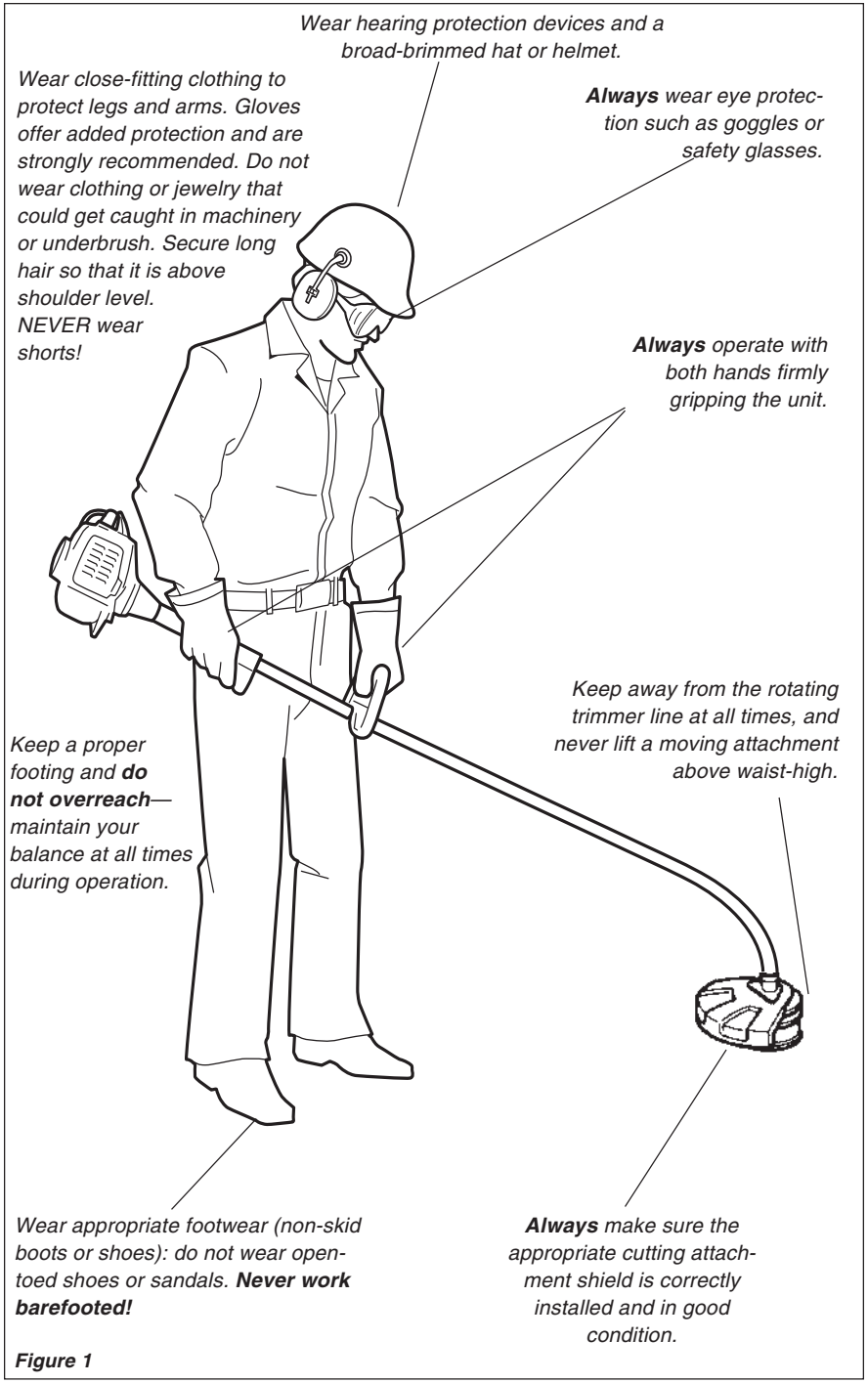
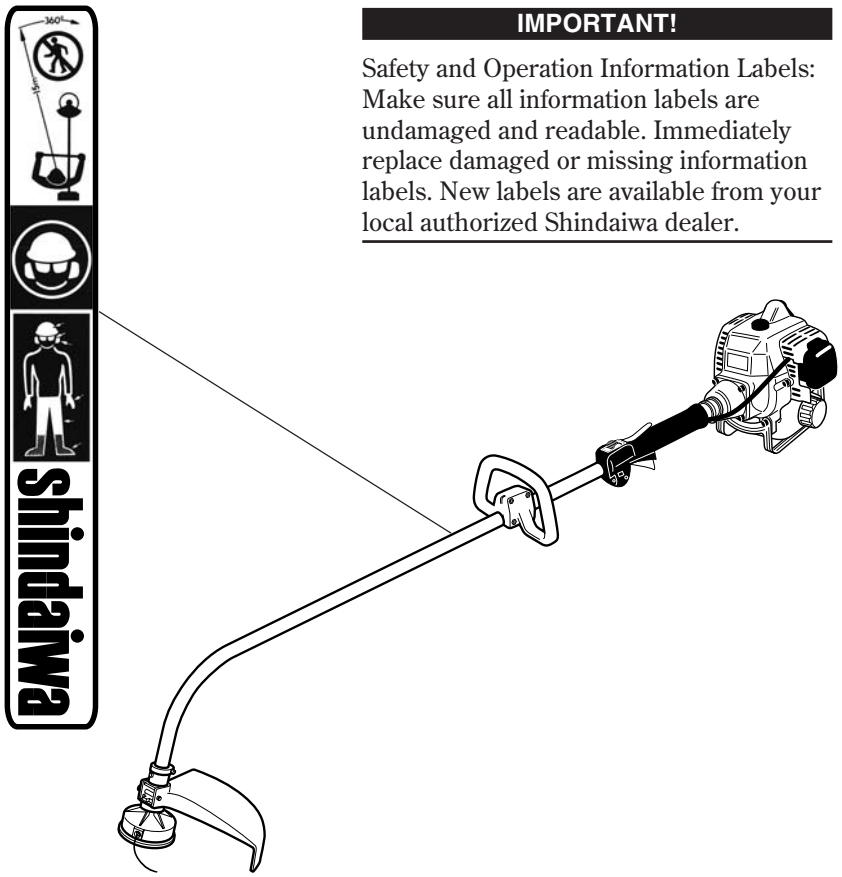

Wear hearing protection devices and a broad-brimmed hat or helmet.
Wear close-fitting clothing to protect legs and arms. Gloves offer added protection and are strongly recommended. Do not wear clothing or jewelry that could get caught in machinery or underbrush. Secure long hair so that it is above shoulder level. NEVER wear shorts!
***Always** wear eye protection such as goggles or safety glasses.*
***Always** operate with both hands firmly gripping the unit.*
Keep away from the rotating trimmer line at all times, and never lift a moving attachment above waist-high.
*Keep a proper footing and **do not overreach**— maintain your balance at all times during operation.*
*Wear appropriate footwear (non-skid boots or shoes): do not wear open-toed shoes or sandals. **Never work barefooted!***
***Always** make sure the appropriate cutting attachment shield is correctly installed and in good condition.*

Figure 1

Safety Labels



IMPORTANT!

Safety and Operation Information Labels: Make sure all information labels are undamaged and readable. Immediately replace damaged or missing information labels. New labels are available from your local authorized Shindaiwa dealer.

Figure 2

Troubleshooting Guide

ADDITIONAL PROBLEMS

Excessive vibration.	Warped or damaged tool.	Inspect and repair tool as required.
	Loose gearcase.	Tighten gearcase securely.
	Bent main shaft/worn or damaged bushings.	Inspect and replace as necessary.
Cutting attachment will not move.	Shaft not installed in powerhead, coupler or gearcase.	Inspect and reinstall as required.
	Broken shaft.	Consult with an authorized servicing dealer.
	Damaged gearcase.	Consult with an authorized servicing dealer.

Troubleshooting Guide

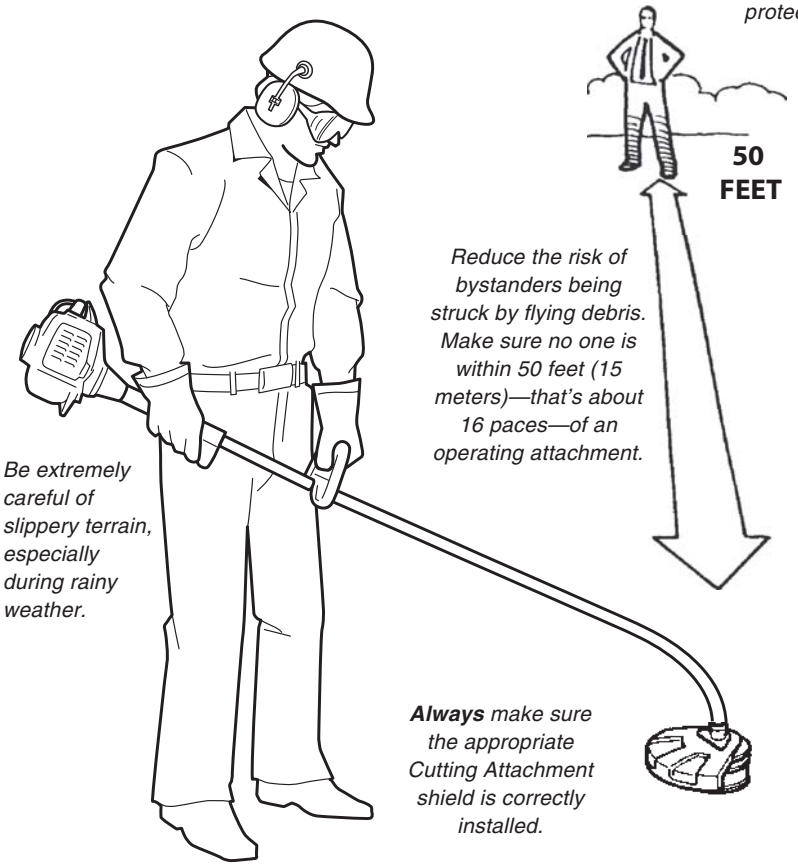
ADDITIONAL PROBLEMS

Poor acceleration.	Clogged air cleaner element.	Clean the air cleaner element.
	Clogged fuel filter.	Replace the fuel filter.
	Carburetor mixture too lean.	Consult with an authorized servicing dealer.
	Idle speed set too low.	Adjust: 2,750 rpm (min^{-1}) (±250)
Engine stops abruptly.	Switch turned off.	Reset the switch and re-start.
	Fuel tank empty.	Refuel.
	Clogged fuel filter.	Replace filter.
	Water in the fuel.	Drain and refill with fresh, clean unleaded gasoline with a pump octane of 87 or higher mixed with 50:1 Shindaiwa Premium 2-cycle mixing oil or with an equivalent high quality 2-cycle mixing oil.
	Shorted spark plug or loose terminal.	Clean and replace spark plug, tighten the terminal.
	Ignition failure.	Consult with an authorized servicing dealer.
	Piston seizure.	Consult with an authorized servicing dealer.
Engine difficult to shut off.	Ground (stop) wire is disconnected, or switch is defective.	Test and replace as required.
	Overheating due to incorrect spark plug.	Replace the spark plug with a Champion CJ8 or equivalent spark plug of the correct heat range. (For electro magnetic compliance (EMC) use a NGK BMR6A resistor plug) Adjust the spark plug electrode gap to 0.024-inch (0.6 mm).
	Overheated engine.	Idle engine until cool.
Cutting attachment moves at engine idle.	Engine idle too high.	Set idle: 2,750 rpm (min^{-1}) (±250)
	Broken clutch spring or worn clutch spring boss.	Replace spring/shoes as required, check idle speed.

Be Aware of the Working Environment

Avoid long-term operation in very hot or very cold weather.

Make sure bystanders or observers outside the 50-foot "danger zone" wear eye protection.



Reduce the risk of bystanders being struck by flying debris. Make sure no one is within 50 feet (15 meters)—that's about 16 paces—of an operating attachment.

Be extremely careful of slippery terrain, especially during rainy weather.

***Always** make sure the appropriate Cutting Attachment shield is correctly installed.*

If contact is made with a hard object, stop the engine and inspect the cutting attachment for damage.

When operating in rocky terrain or near electric wires or fences, use extreme caution to avoid contacting such items with the cutting attachment.

Be constantly alert for objects and debris that could be thrown from the rotating cutting attachment or bounced from a hard surface.

Figure 3

Check Unit Condition

NEVER operate the unit with the cutting attachment shield or other protective devices (harness, ignition switch, etc.) removed!

WARNING!

A Cutting Attachment Shield or other protective device is no guarantee of protection against ricochet. YOU MUST ALWAYS GUARD AGAINST FLYING DEBRIS!

Use only authorized Shindaiwa parts and accessories with your Shindaiwa trimmer. Do not make modifications to this unit without the written approval of Shindaiwa, Inc.

ALWAYS make sure the cutting attachment is properly installed and firmly tightened before operation.

NEVER use a cracked or warped cutting attachment: replace it with a serviceable one.

ALWAYS make sure the cutting attachment fits properly into the cutter holder. If a properly installed attachment vibrates, replace the attachment with new one and re-check.

ALWAYS stop the engine immediately and check for damage if you strike a foreign object or if the unit becomes tangled. Do not operate with broken or damaged equipment.

NEVER allow the engine to run at high RPM's without a load. Doing so could damage the engine.

NEVER operate a unit with worn or damaged fasteners or attachment holders.

Troubleshooting Guide

LOW POWER OUTPUT

Is the engine overheating?	Operator is overworking the machine.	Shorten trimmer line. Cut at a slower rate.
	Carburetor mixture is too lean.	Consult with an authorized servicing dealer.
	Improper fuel ratio.	Refill with fresh, clean unleaded gasoline with a pump octane of 87 or higher mixed with 50:1 Shindaiwa Premium 2-cycle mixing oil or with an equivalent high quality 2-cycle mixing oil.
	Fan, fan cover, cylinder fins dirty or damaged.	Clean, repair or replace as necessary.
	Carbon deposits on the piston or in the muffler.	Consult with an authorized servicing dealer.
Engine is rough at all speeds. May also have black smoke and/or unburned fuel at the exhaust.	Clogged air cleaner element.	Service the air cleaner.
	Loose or damaged spark plug.	Tighten or replace. Replace the spark plug with a Champion CJ8 or equivalent spark plug of the correct heat range. (For electro magnetic compliance (EMC) use a NGK BMR6A resistor plug) Adjust the spark plug electrode gap to 0.024-inch (0.6 mm).
	Air leakage or clogged fuel line.	Repair or replace fuel filter and/or fuel line.
	Water in the fuel.	Refill with fresh, clean unleaded gasoline with a pump octane of 87 or higher mixed with 50:1 Shindaiwa Premium 2-cycle mixing oil or with an equivalent high quality 2-cycle mixing oil.
	Piston seizure.	Consult with an authorized servicing dealer.
	Faulty carburetor and/ or diaphragm.	Consult with an authorized servicing dealer.
Engine is knocking.	Overheating condition.	See above.
	Improper fuel.	Check fuel octane rating; check for presence of alcohol in the fuel (pg. 17). Refuel as necessary.
	Carbon deposits in the combustion chamber.	Consult with an authorized servicing dealer.

Troubleshooting Guide

ENGINE DOES NOT START

Does the engine crank?	Faulty recoil starter. Fluid in the crankcase. Internal damage.	Consult with an authorized servicing dealer.
Good compression?	Loose spark plug. Excess wear on cylinder, piston, rings.	Tighten and re-test. Consult with an authorized servicing dealer.
Does the tank contain fresh fuel of the proper grade?	Fuel incorrect, stale, or contaminated; mixture incorrect.	Refill with fresh, clean unleaded gasoline with a pump octane of 87 or higher mixed with 50:1 Shindaiwa Premium 2-cycle mixing oil or with an equivalent high quality 2-cycle mixing oil.
Is fuel visible and moving in the return line when priming?	Check for clogged fuel filter and/or vent.	Clean as required; restart.
Is there spark at the spark plug wire terminal?	The ignition switch is in "O" (OFF) position. Shorted ignition ground. Faulty ignition unit.	Move switch to "I" (ON) position and re-start. Consult with an authorized servicing dealer.
Check the spark plug.	If the plug is wet, excess fuel may be in the cylinder.	Crank the engine with the plug removed, reinstall the spark plug, and re-start.
	The plug is fouled or improperly gapped.	Clean and re-gap the spark plug to 0.024 inch (0.6 mm). Re-start.
	The plug is damaged internally or of the wrong size.	Replace the spark plug with a Champion CJ8 or equivalent spark plug of the correct heat range. (For electro magnetic compliance (EMC) use a NGK BMR6A resistor plug) Adjust the spark plug electrode gap to 0.024-inch (0.6 mm).

Product Description

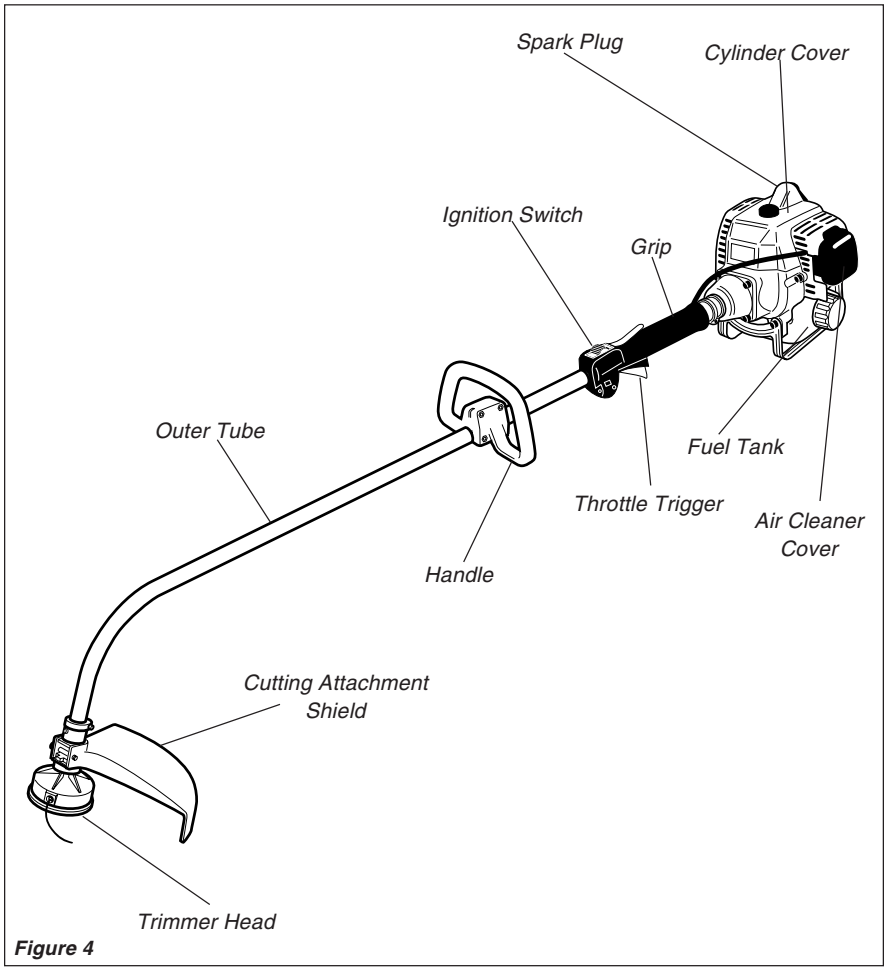


Figure 4

Using the accompanying illustrations as a guide, familiarize yourself with your unit and its various components. Understanding your unit helps ensure top performance, long service life, and safer operation.

WARNING!

Do not make unauthorized modifications or alterations to any of these products or their components.

Specifications*

Shindaiwa Model/Engine	F230/SE230
Transmission Type	Automatic centrifugal clutch with flexible shaft
Gear Reduction	Direct coupling
Rotation	Clockwise (when viewed from the top)
Operating Speed	5000—9000 rpm (min^{-1})
Dry Weight	4.4 kg/*9.8 lbs* (not including trimmer head and debris shield)
Engine Dimensions (L x W x H)	1770 x 280 x 280 mm/*70 x 11 x 11 inches*
Engine Type	2-cycle, vertical-cylinder, air-cooled
Bore x Stroke	32 x 28 mm/*1.26 x 1.10 in.*
Displacement	22.5 cc/*1.4 cu. in.*
Maximum Power Output	*1.1 HP @ 7500 rpm* (min^{-1})
Fuel/Oil Ratio	50:1 with Shindaiwa 2-cycle Mixing Oil
Fual Tank Capacity	554 ml/*18.7 oz.*
Carburetor Type	Walbro WYL, diaphragm-type
Ignition	One-piece electronic, transistor-controlled
Spark Plug	Champion CJ8
	For electro magnetic compliance (EMC) use NGK BMR6A
Air Cleaner Type	Non-reversible flocked filter element
Starting Method	Recoil
Stopping Method	Slide switch

*Specifications are subject to change without notice.

Prior to Assembly

Before assembling, make sure you have all the components required for a complete unit:

- Engine assembly
- Outer tube assembly
- Cutting attachment shield
- Trimmer head
- Tool kit containing hex wrench, open-end wrench (8 mm and 10 mm), spark-plug/screwdriver combination wrench, and this manual

Carefully inspect all components for damage.

IMPORTANT!

The terms “left”, “left-hand”, and “LH”; “right”, “right-hand”, and “RH”; “front” and “rear” refer to directions as viewed by the operator during normal operation.

FLEXIBLE DRIVE CABLE Clean and lubricate the flexible drive cable as follows:

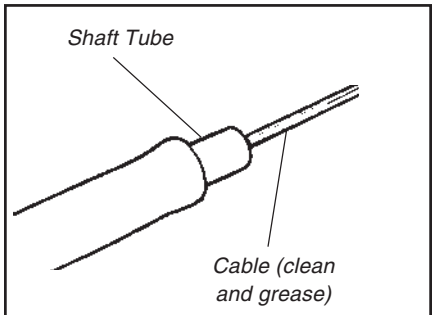


Figure 28

1. Remove the powerhead and slide the flexible cable from the shaft tube assembly.
2. Wash the cable thoroughly in a solvent bath, and then coat the entire cable with Shindaiwa Premium Gearcase Lubricant.
3. Install the cable in the shaft tube, then replace the powerhead in the reverse order of removal.

NOTE:

For maximum cable life, the flexible cable should be reversed “end-for-end” during reinstallation.

Long Term Storage

Whenever the unit will not be used for 30 days or longer, use the following procedures to prepare it for storage:

- Clean external parts thoroughly and apply a light coating of oil to all metal surfaces.
- Drain all the fuel from the fuel tank.

IMPORTANT!

All stored fuels should be stabilized with a fuel stabilizer such as STA-BIL™ , if Shindaiwa ONE oil with fuel stabilizer is not used.

To remove the remaining fuel from the fuel lines and carburetor and with the fuel drained from the fuel tank.

1. Prime the primer bulb until no more fuel is passing through.
2. Start and run the engine until stops running.
3. Repeat steps 1 and 2 until the engine will no longer start.

CAUTION!

Gasoline stored in the carburetor for extended periods can cause hard starting, and could also lead to increased service and maintenance costs.

- Remove the spark plug and pour about 1/4 ounce of 2-cycle mixing oil into the cylinder through the spark plug hole. Slowly pull the recoil starter 2 or 3 times so oil will evenly coat the interior of the engine. Reinstall the spark plug.
- Before storing the unit, repair or replace any worn or damaged parts.
- Remove the air cleaner element from the carburetor and clean it thoroughly with soap and water. Let dry and reassemble the element.
- Store the unit in a clean, dust-free area.

135-hour Maintenance

After every 135 hours of operation or if engine becomes hard to start and has low power. The spark arrester screen should be inspected and cleaned.

WARNING!

Never operate the unit with a damaged or missing muffler or spark arrester! Operating with missing or damaged exhaust components is a fire hazard and could also damage your hearing.

1. Remove the spark plug boot.
2. Remove the engine cover by loosening the engine cover knob (the knob is captive) and lifting the cover from the engine.
3. Remove the spark arrester screen screw.
4. Remove the spark arrester screen and clean with a stiff bristle brush.

IMPORTANT!

If carbon deposits are severe or if no performance improvement is noted, your 230 grass trimmer should be returned to your Shindaiwa authorized servicing dealer.

5. Reassemble the spark arrester screen and engine cover in reverse order.

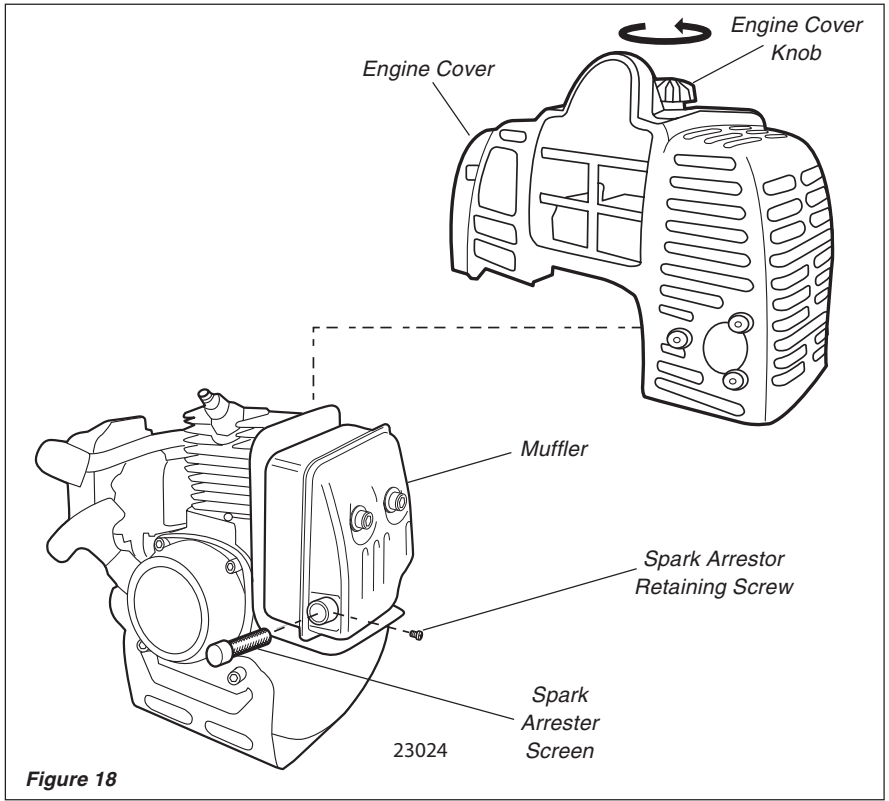


Figure 18

Assembly

Driveshaft/Powerhead

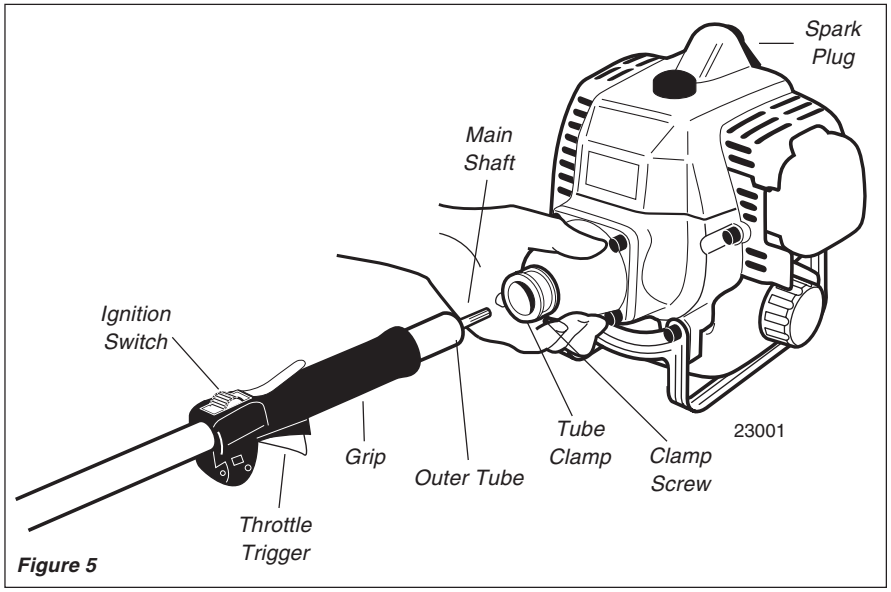


Figure 5

Connect the Outer Tube to the Powerhead

1. Place the powerhead on a clean, flat surface, spark plug facing up. See Figure 5.
2. Use the 4mm hex wrench to loosen the tube clamp screw. Verify that the D-shaped shim washer is positioned as shown in Figure 6.

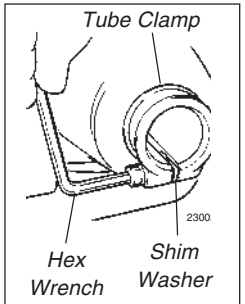


Figure 6

CAUTION!

Do not remove the D-shaped shim washer! The shim washer prevents damage from overtightening the tube clamp screw.

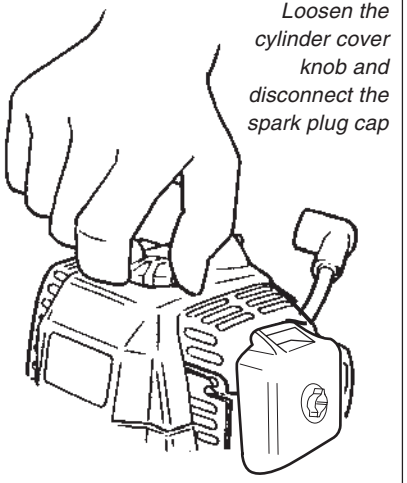
3. Slide the outer tube into the tube clamp until the tube bottoms. If installation is difficult, rotate the outer tube or mainshaft slightly until you feel the flexible shaft engage with the powerhead.
4. Position the outer tube so that the ignition switch is facing up and the throttle trigger is down. Slide the outer tube into the powerhead until the throttle grip just contacts the tube clamp.
5. Tighten the clamp screw firmly.

CAUTION!

Do not force the shaft tube into the powerhead! Excessive force can damage the shaft tube and mainshaft.

Assembly

Throttle Linkage and Ignition Leads



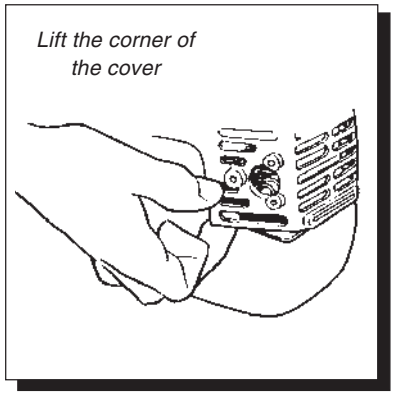


Figure 7

Remove the Cylinder Cover.

1. Remove the cap from the spark plug.
2. Loosen the black cylinder cover knob (about a dozen full turns are required), and then lift off the cylinder cover.

NOTE:

If the cover binds on the muffler outlet tube, pull gently on the corner of the cover as shown (see inset).

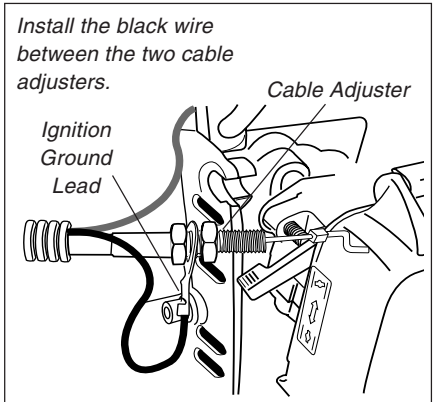


Figure 8

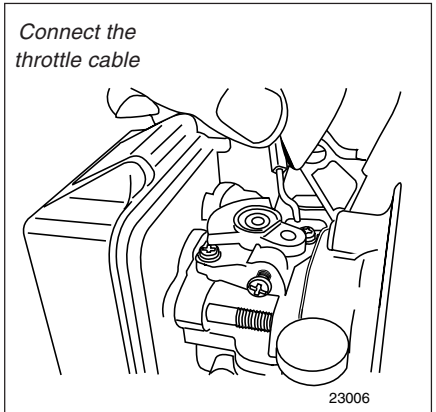


Figure 9

Connect the Throttle Cable.

1. Route the ribbed cable over the tube clamp to the top left side of the engine.
2. Install the black wire between the two cable adjuster nuts as shown. See Figure 8.
3. Connect the S-shaped end of the throttle cable to the throttle lever on top of the carburetor. See Figure 9.

50-Hour Maintenance

Every 50 hours of operation (more frequently in dusty or dirty conditions):

- Remove and clean the cylinder cover and clean grass and dirt from the cylinder fins.
- Use a hooked wire to extract the fuel filter from inside the fuel tank. See figure 26. Remove and replace the filter element. Before reinstalling the filter, inspect the condition of the fuel line. If damage or deterioration is noted, the F230 Grass Trimmer should be removed from service until it can be inspected by a Shindaiwa-trained service technician.

CAUTION!

Make sure you do not pierce the fuel line with the end of the hooked wire, the line is delicate and can be damaged easily.

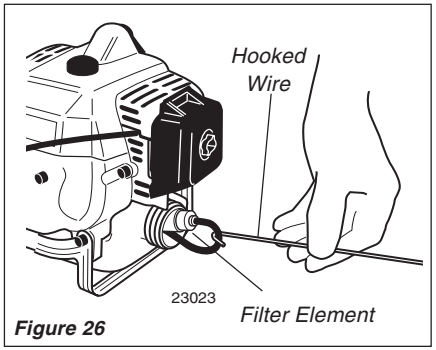


Figure 26

10-Hour Maintenance

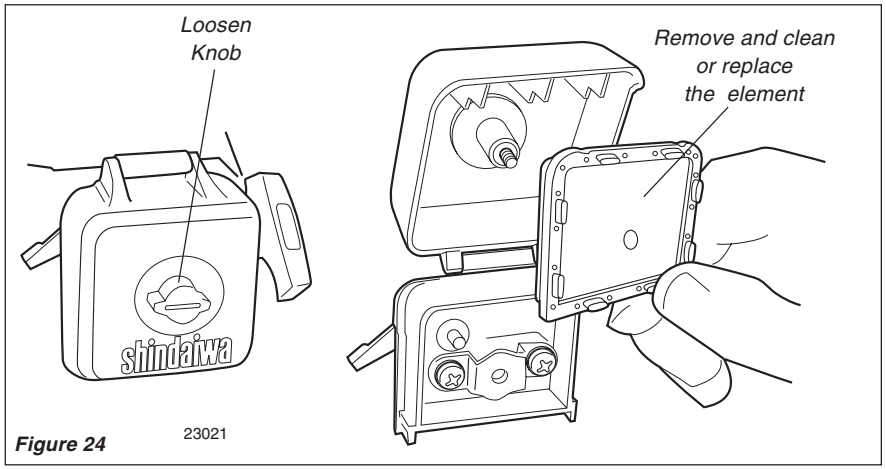


Figure 24

Every 10 hours of operation (more frequently in dusty or dirty conditions):

Remove the air cleaner element. See figure 24. Clean or replace as necessary. To clean element: Wash it thoroughly in soap and water. Let it dry before reinstalling the element.

CAUTION!

Do not operate the unit if the air cleaner or element is damaged, or if the element is wet.

10/15-Hour Maintenance

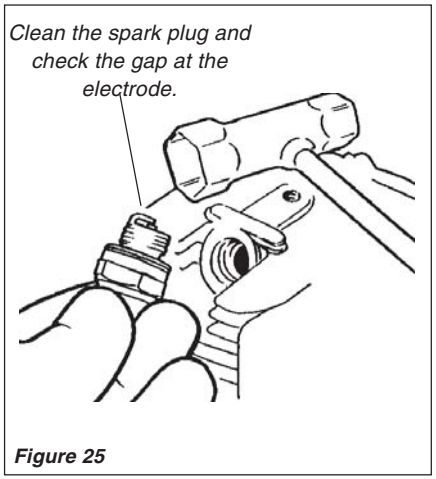


Figure 25

Every 10 to 15 hours of operation: Remove and clean the spark plug. Adjust the spark plug electrode gap to 0.024-inch (0.6 mm). If the spark plug must be replaced, use only a Champion CJ8 or equivalent spark plug of the correct heat range. (For electro magnetic compliance (EMC) use a NGK BMR6A resistor plug.) See Figure 25.

CAUTION!

Before removing the spark plug, clean the area around the plug to prevent dirt and debris from falling into internal engine parts.

Assembly

Throttle Linkage and Ignition Leads

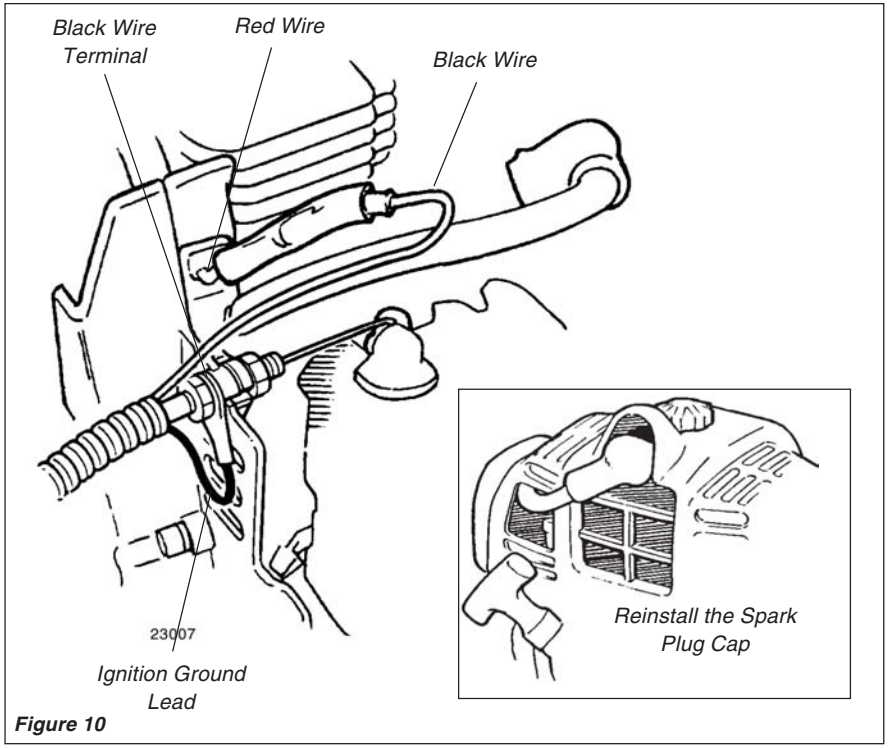


Figure 10

Assemble and Adjust the Throttle Cable.

1. Insert the throttle-cable housing into the notch on the fan cover, and clamp the black wire's connector between the fan cover and the outer cable adjuster nut. See Figure 10.
2. Tighten the two throttle cable adjuster nuts.

IMPORTANT!

Adjust and tighten the cable nuts to allow approximately 1/4-inch freeplay at the throttle trigger.

3. Using finger pressure only, connect the black switch wire from the cable tube to the red ignition wire on the powerhead. Wire routing must be as shown in the illustration with the black wire located away from the throttle cable and carburetor linkage.
4. Reinstall the engine cover and tighten the captive engine cover screw. Re-install the lower engine cover screws.
5. Reinstall the spark plug boot.

CAUTION!

Routing of wiring must not interfere with throttle operation.

Assembly

Handle

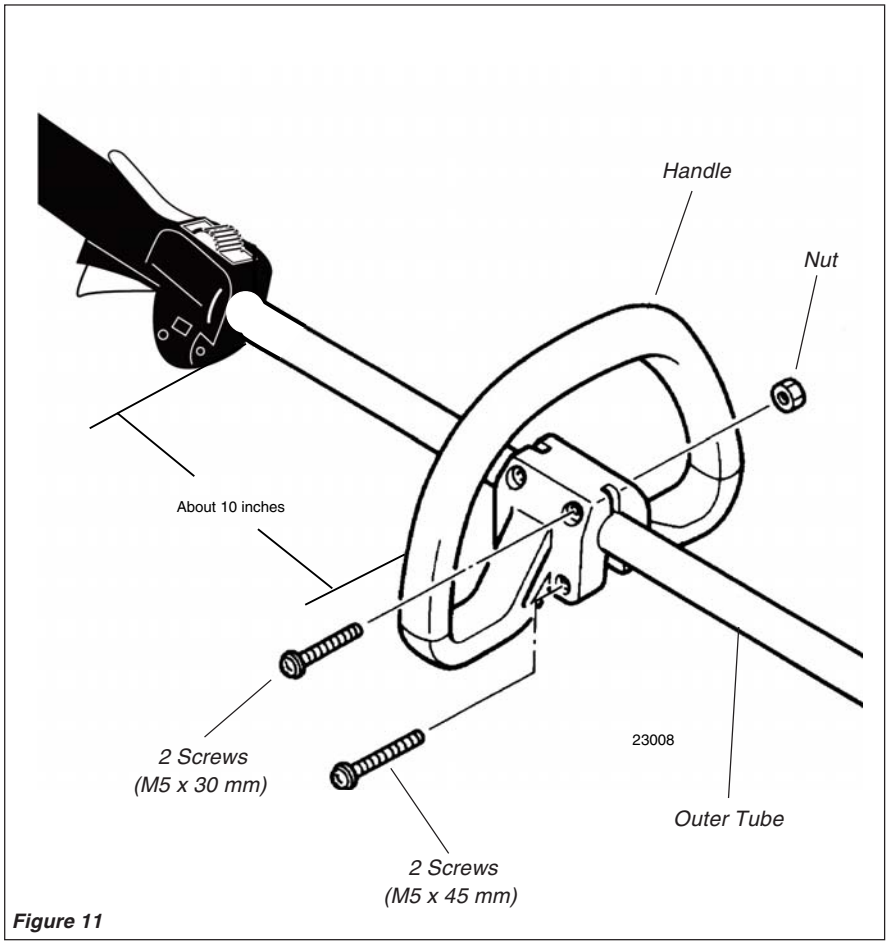


Figure 11

Connect the Handle to the Outer Tube.

1. Position the handle on the outer tube as shown.
2. Gently press the handle onto the outer tube.
3. Install the 30 mm screws securing the handle (30mm [1-in.] upper, 45mm [1.7-in.] lower). Tighten finger-tight ONLY at this time.
4. Locate the handle in the best position for operator comfort (usually about 10 inches ahead of the throttle lever).
5. Secure the handle by alternately tightening the four socket-head screws in a diagonal or "criss-cross" fashion.

NOTE:

The screws and nuts are packed in the tool kit.

General Maintenance

IMPORTANT!

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A DEALER OR SERVICE CENTER AUTHORIZED BY SHINDAIWA KOGYO CO., LTD. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

WARNING!

Before performing any maintenance, repair or cleaning work on the unit, make sure the engine and cutting attachment are completely stopped. Disconnect the spark plug wire before performing service or maintenance work.

WARNING!

Non-standard parts may not operate properly with your unit and may cause damage and lead to personal injury.

NOTE:

Using non-standard replacement parts could invalidate your Shindaiwa warranty.

Muffler

This unit must never be operated with a faulty or missing spark arrestor or muffler. Always make sure the muffler is tightly secured and in good condition. A worn or damaged muffler is a fire hazard and may also cause hearing loss.

Spark Plug

Keep the spark plug and wire connections clean and tight.

Fasteners

Make sure nuts, bolts, and screws (except carburetor adjusting screws) are tight.

Daily Maintenance

Prior to each work day, perform the following:

- Remove all dirt and debris from the engine, check the cooling fins and air cleaner for clogging, and clean as necessary.
- Carefully remove any accumulations of dirt or debris from the muffler and fuel tank. Dirt build-up in these areas can lead to engine overheating, fire, or premature wear.
- Check for loose or missing screws or components. Make sure the cutting attachment is securely fastened.
- Check the entire unit for leaking fuel or grease.

Cutting Grass

Your Shindaiwa F230 Grass Trimmer may be equipped with one of several Shindaiwa trimmer head models, each with features for specific applications and/or operational requirements.

NOTE:

For proper operation, always refer to the instructions accompanying the trimmer head being used.

Available trimmer head styles include:

- **Semi-automatic.** Trimmer line is indexed when the operator taps the trimmer head on the ground during operation.
- **Manual.** The operator indexes line manually with the grass trimmer stopped.

CAUTION!

Do not push the rotating line into trees, wire fences, or any material that could tangle or break line ends.

Engine Operating Speeds

Operate the unit at full throttle while cutting grass.

CAUTION!

Operation at low RPM can lead to premature clutch failure.

Trimming and Mowing Grass

Figure 22

Hold the grass trimmer so the trimmer head is angled slightly into the area to be cut. To ensure maximum trimmer-line service life, cut only with the tip of the trimmer line. Cut grass by swinging the unit's trimmer head from left to right. Keep the trimmer head horizontal.

Edging

Tilt the handle about 100° to the left (from horizontal) and move forward, holding the trimmer vertically.

Figure 23

Assembly

Cutting Attachment Shield

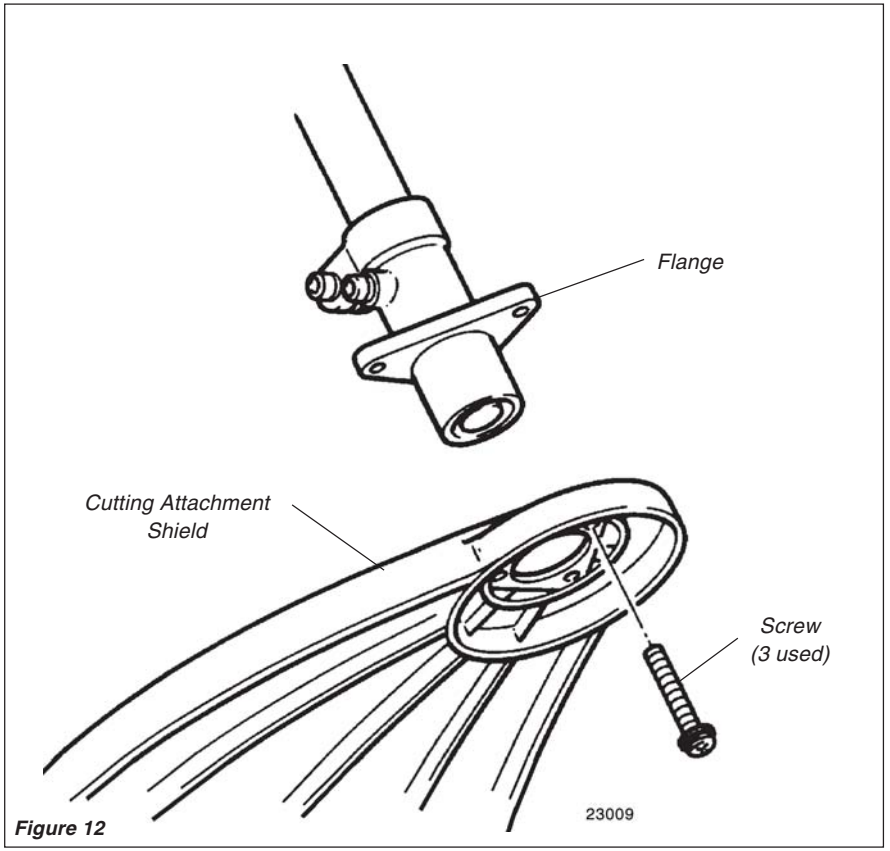


Figure 12

Install the Cutting Attachment Shield on the Outer Tube.

1. Align the cutting attachment shield under the flange as shown
2. Tighten the three screws finger-tight ONLY at this time.
3. Secure the cutting attachment shield by alternately tightening the three screws.

CAUTION!

Attach the screws "finger-tight" before final tightening.

WARNING!

Carefully inspect the cutting attachment shield installation to make sure it is tightened securely and does not wobble. DO NOT OPERATE THE F230 WITHOUT THE CUTTING ATTACHMENT SHIELD IN PLACE AND TIGHTLY SECURED!

Assembly

Trimmer Head

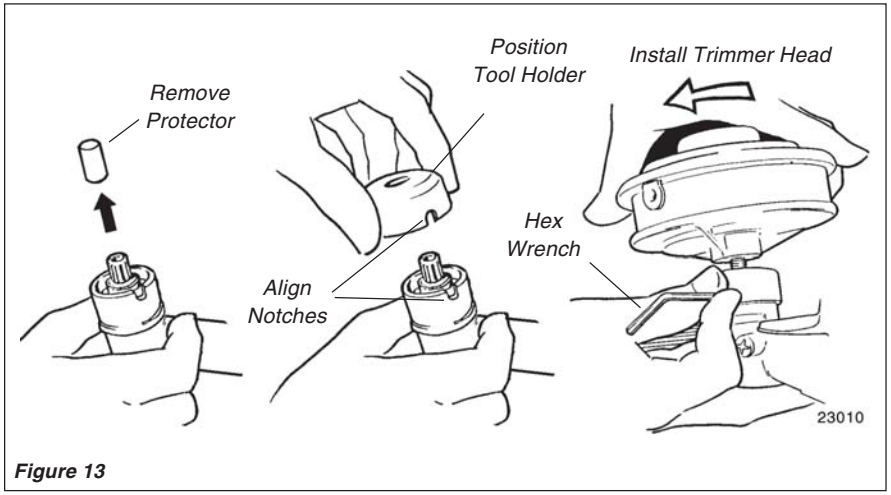


Figure 13

Mount the Trimmer Head.

1. Turn the unit over so the shaft from the gearcase faces up. Remove the plastic protector from the shaft.
2. Slip the trimmer head holder onto the gearcase shaft.
3. Rotate the trimmer head holder until the notch on its skirt aligns with the hole in the gearcase, then insert the long end of the hex wrench into the hole (the wrench prevents the gear shaft from rotating while the trimmer head is being installed).
4. While holding the hex wrench, fit the trimmer head onto the holder and thread it in place.

IMPORTANT!

The trimmer head has a right-hand thread, so turn it clockwise to install.

5. Remove the hex wrench.

WARNING!

The F230 Grass Trimmer should NEVER be operated with a blade-type attachment.

Your F230 Grass Trimmer should now be completely assembled.

Checking Unit Condition

NEVER operate the unit with the cutting attachment shield or other protective devices (ignition switch etc.) removed!

WARNING!

A cutting attachment shield or other protective device is no guarantee of protection against ricochet. YOU MUST ALWAYS GUARD AGAINST FLYING DEBRIS!

Use only authorized Shindaiwa parts and accessories with your Shindaiwa trimmer. Do not make modifications to your unit without the written approval of Shindaiwa, Inc.

ALWAYS make sure the tool is properly installed and firmly tightened before operation.
NEVER use a cracked or warped cutting attachment: replace it with a serviceable one.
ALWAYS make sure the cutting attachment fits properly into the appropriate attachment holder. If a properly installed attachment vibrates, replace the attachment with a new one and re-check.
ALWAYS stop the engine immediately and check for damage if you strike a foreign object or if the unit becomes entangled. Do not operate with broken or damaged equipment.
NEVER allow the engine to run at high RPM without a load. Doing so could damage the engine.
NEVER operate a unit with worn or damaged tools or tool holder.

Shoulder Strap

Adjust the shoulder strap so the pad rests comfortably on the off-side shoulder with the cutting attachment parallel to the ground. Make sure all hooks and adjustment devices are secure.

NOTE:

Although a shoulder strap accessory is not required for use with 230 grass trimmers, a shoulder strap can increase operator comfort during extended periods of operation.
See Figure 21.

Figure 21

Optional Accessories

Shoulder Strap ..... P/N 22410-17202
Hangar ..... P/N 22410-12210
Hangar Bolt ..... P/N 01020-05120
Hangar Nut ..... P/N 01500-05041
Spacer ..... P/N 22035-14130

Stopping the Engine

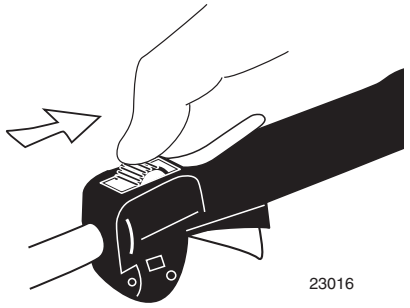


Figure 19

Idle the engine briefly before stopping (about 2 minutes), then slide the ignition switch to the “O” (engine OFF) position.

Adjusting Engine Idle

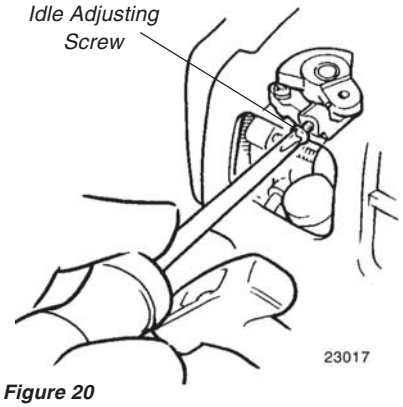


Figure 20

The engine must return to idle speed whenever the throttle lever is released. Idle speed is adjustable, and must be set low enough to permit the engine clutch to disengage the cutting attachment.

Idle Speed Adjustment

WARNING!

The cutting attachment must NEVER rotate at engine idle! If the idle speed cannot be adjusted by the procedure described here, return the trimmer to your Shindaiwa dealer for inspection.

1. Place the trimmer on the ground, then start the engine, and then allow it to idle 2-3 minutes until warm.
2. If the attachment rotates when the engine is at idle, reduce the idle speed by turning the idle adjustment screw counter-clockwise. See Figure 20.
3. If a tachometer is available, the engine idle speed should be final adjusted to 2,750 (±250) rpm (min^{-1}).
4. Carburetor fuel mixture adjustments are preset at factory and cannot be serviced in the field.

Mixing Fuel

CAUTION!

Some types of gasoline contain alcohol as an oxygenate. Oxygenated gasoline may cause increased operating temperatures. Under certain conditions, alcohol-based gasoline may also reduce the lubricating qualities of some 2-cycle mixing oils. Never use any type of gasoline containing more than 10% alcohol by volume! Generic oils and some outboard oils may not be intended for use in high-performance 2-cycle type engines, and should never be used in your Shindaiwa engine.

CAUTION!

This engine is designed to operate on a 50:1 mixture consisting of unleaded gasoline and 2-cycle mixing oil only. Use of non-approved mixing oils can lead to excessive carbon deposits.

- Use only fresh, clean unleaded gasoline with a pump octane of 87 or higher.
- Mixed with 50:1 Shindaiwa Premium 2-cycle mixing oil or with an equivalent high quality 2-cycle mixing oil.

Examples of 50:1 mixing quantities

- 1 gallon of gasoline to 2.6 oz. mixing oil
- 5 litres of gasoline to 100 ml. mixing oil

IMPORTANT!

Mix only enough fuel for your immediate needs! If fuel must be stored longer than 30 days and Shindaiwa ONE oil with fuel stabilizer is not used, it should first be treated with a fuel stabilizer such as StaBil™.

Filling the Fuel Tank

WARNING!

Minimize the risk of fire!

- Stop engine before refueling.
- Always allow the engine to cool before refueling!
- Wipe all spilled fuel and move the engine at least 10 feet (3 meters) from the fueling point and source before restarting!
- Never smoke or light any fires near the engine or fuel source!
- Never place any flammable material near the engine muffler!
- Never operate the engine without the muffler and spark arrester in good working condition.

1. Place the trimmer on a flat, level surface.
2. Clear any dirt or other debris from around the fuel filler cap.
3. Remove the fuel cap, and fill the tank with clean, fresh fuel.
4. Reinstall the fuel filler cap and tighten firmly.

Starting the Engine

IMPORTANT!

Engine ignition is controled by a two position switch mounted on the throttle housing labeled, "I" for ON or START and "O" for OFF or STOP.

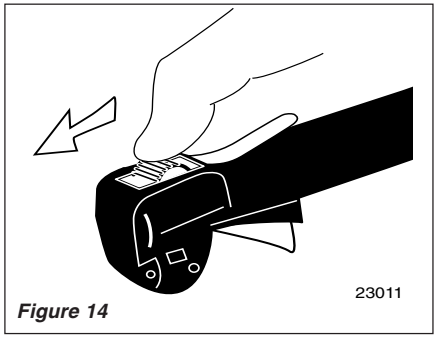


Figure 14

1. Slide the ignition switch to the “I” position (engine ON).

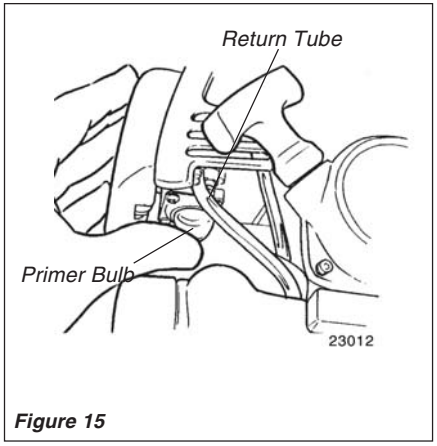


Figure 15

2. Press the primer bulb until fuel can be seen flowing in the transparent return tube.

IMPORTANT!

The primer system only pushes fuel through the carburetor. Repeatedly pressing the primer bulb will not flood the engine with fuel.

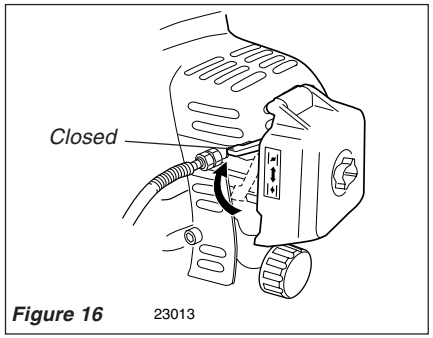


Figure 16

3. Set the choke lever to the CLOSED position if engine is cold.

Figure 17

4. While holding the outer tube firmly with one hand, slowly pull the recoil starter handle until resistance is felt, then pull quickly to start the engine.

CAUTION!

Do not pull the recoil starter to the end of the rope travel. Pulling the recoil starter to the end of the rope travel can damage the starter.

Starting the Engine (continued)

WARNING!

The cutting attachment may rotate when the engine is started!

5. When the engine starts, slowly move the choke lever to the "OPEN" position. See Figure 18. (If the engine stops after the initial start, close the choke and restart.)

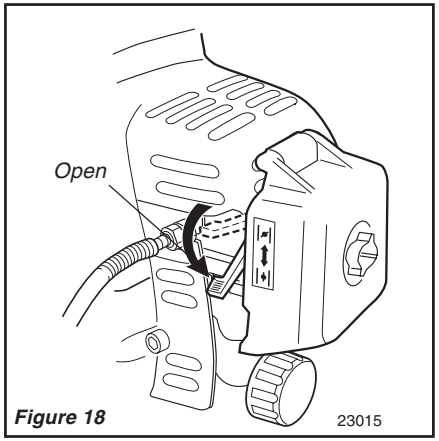


Figure 18

WARNING!

Never start the engine from the operating position.

IMPORTANT!

If the engine fails to start after several attempts with the choke in the closed position, the engine may be flooded with fuel. If flooding is suspected, move the choke lever to the open position and repeatedly pull the recoil starter to remove excess fuel and start the engine. If the engine still fails to start, refer to the troubleshooting section of this manual.

When the Engine Starts...

- After the engine starts, allow the engine to warm up at idle 2 or 3 minutes before operating the unit.
- After the engine is warm, pick up the unit and clip on the harness if so equipped. See page 21.
- Advancing the throttle makes the cutting attachment turn faster; releasing the throttle permits the attachment to stop turning. If the cutting attachment continues to rotate when the engine returns to idle, carburetor idle speed should be adjusted (see the next page).